※ 考生請注意：本試題不可使用計算機

1. Name the three competitive priorities for time, and give an example of each. (9%)

2. Describe the differences among make-to-order, assemble-to-order, and make-to-stock strategies from the producer's and from the customer's perspective. (12%)

3. Schmidt Industries makes four different snake traps; the Harlan, the Gaylen, the Leah and the Matthew. The Harlan sells for $200 and has $40 in parts and $40 in labor; the Gaylen sells for $150 and requires $30 in parts and $30 in labor; the Leah sells for $100 and has $20 in parts and $20 in labor; and the Matthew sells for $75 but requires only $10 of parts and $10 of labor. Schmidt Industries has four machines (we'll call them A, B, C, and D for convenience) that are used in the production of each of these products. Each of these machines is available for 40 hours a week and there is no setup time required when shifting from the production of one product to any other. The processing requirements to make one unit of each product are shown in the table.

Model	Processing Time on Each Machine in Minutes			
	Machine A	Machine B	Machine C	Machine D
Harlan	10	15	15	5
Gaylen	10	10	10	10
Leah	5	10	15	10
Matthew	5	5	5	10

Schmidt Industries has monthly fixed costs of $5000 and has a demand forecast of 80 Harlans, 60 Gaylens, 40 Leahs and 20 Matthews for the coming month. How many of each of the four models should Susan, the operations manager, schedule for production this month? (9%)

※ 考生請注意：本試題不可使用計算機

4. Phoebe B. Beebee is constructing a canal for the annual canoe races and has identified eleven activities that are required to complete this important project. She calculated early and late start times and early and late finish times but spilled coffee all over her printout. Use the remaining information to reconstruct the table for Phoebe B. Beebee and her new canoe canal. (20%)

Activity	Predecessor	Length	Early Start	Late Start	Early Finish	Late Finish
A	--				12	
B	A	20				
C	A					
D	B, E			42		
E	C		28			42
F	E		42		50	
G	D		53	53		
H	G		70			
I	G			72		
J	F	4				81
K	H, I, J			81		91

5. List general types of methods for demand forecasting. Briefly describe how these methods work and when these methods work best. Please keep your answer concise. (15%)

6. Consider a Q inventory system with an EOQ for a specific part equal 1600 units. Assume that both demand and lead time follow normal distributions. The estimated demand is 98 units per day with a standard deviation 10. The expected lead time is 3.96 days with a standard deviation of 1 day. If management wants a 95% service level, find the safety stock and reorder point. (10%)

※ 考生請注意：本試題不可使用計算機

7. The expected total number of nurses required during the day shift for the new opening XYZ City Hospital is shown below. Each nurse work five consecutive days and then with two days off. Assume that each nurse has the same base salary but the hospital gives 20% extra pay for working in the weekend. Formulate an integer programming model to find out how many nurses the hospital should hire. (10%)

Day	Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
Nurses	25	75	70	65	70	50	30

8. A licensed tourist guide offers one-day horse coach tour service for $1000 per person at Tainan City. The service can be reserved on-line one day before the trip. The coach can accommodate four customers for each ride. According to his experience, if all of seats are reserved the probabilities that some of customers did not show up on the day of trip are listed below.

# No-show	0	1	2	3	4
Probability	0.1	0.3	0.3	0.2	0.1

On the day of trip, if there are still some empty seats have not been taken just before the coach departs, the guide will use the last five minutes to find a customer on-site to fill the vacancy with the same $1000 tour fee. According to his experience, the probability to find a customer in the last five minutes is 0.1. Still there are some empty seats sometimes. To avoid opportunity of losing, the guide is considering a policy of accepting more reservations than his coach capacity. When this policy results in more customers than his coach capacity, he plans to hire his competitors to accommodate the overbooked tourists at $1600 each. How many reservations would you recommend overbooking? (15%)